

ABSTRACT OF THE DISCLOSURE

The methods and apparatuses of the invention relate to liquid crystal displays. In one exemplary embodiment, a liquid crystal display includes a liquid crystal layer which has a twist angle in a range of about  $60^\circ$  to about  $90^\circ$  and includes a polarizer positioned to polarize light from a light source to create polarized light such that an angle  $\beta$  exists between a vector of the polarized light and a first alignment direction of the liquid crystal layer. The angle  $\beta$  is in a range of about  $-13^\circ$  to about  $+13^\circ$  and a value of  $\Delta n d$  is in a range of about  $0.1\mu\text{m}$  to about  $0.2\mu\text{m}$  where  $\Delta n$  is a birefringence of the liquid crystal layer and  $d$  is a thickness of the liquid crystal layer. Other features of the invention will be apparent from the accompanying drawings and description.